

NASA TECH BRIEF

Goddard Space Flight Center



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An Economical Arterial-Pulse-Wave Transducer

The problem:

Arteriosclerosis is one of the leading causes of illness and death in human beings. One important method in detection of this disease involves the measurement of arterial pulses by use of transducers which convert these pulses into electronic signals. These signals are recorded and interpreted by physicians who then establish the presence and severity of the disease. Depending on design, transducers may be applied internally or externally. The former is painful because it requires an insertion of a needle into an arterial wall, and the latter requires expensive components to reproduce accurate readings from skin area above the artery.

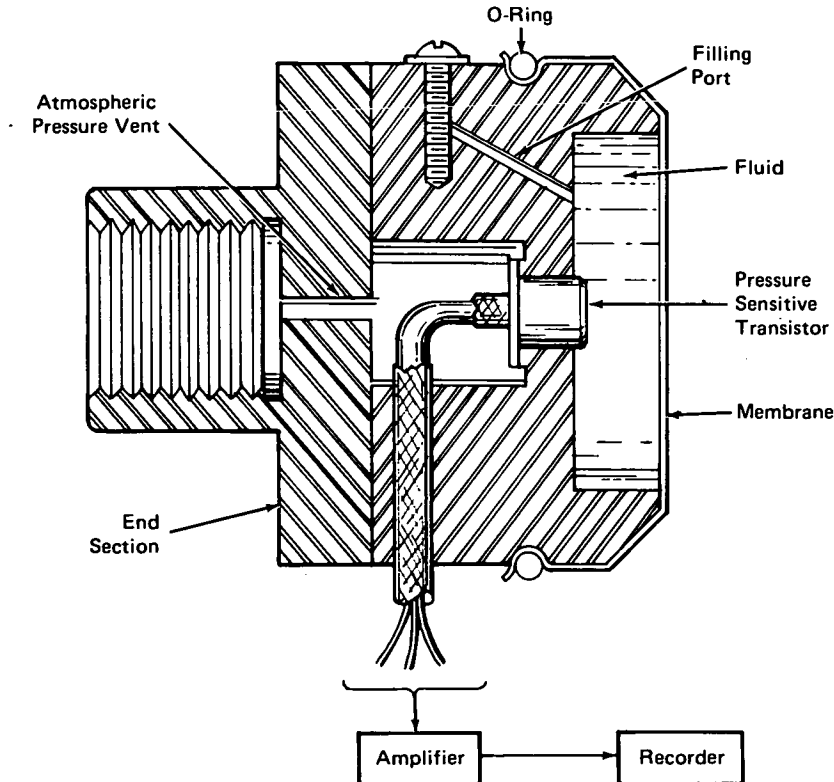
The solution:

An inexpensive arterial-pulse-wave transducer has been developed which can record arterial pulses externally.

How it's done:

The transducer (see figure) uses a thin plastic membrane which is fluid coupled to a pressure sensitive transistor. The transistor is connected to an amplifier which, in turn, is connected to a recorder.

In use, the plastic membrane side is placed in contact with the human skin just above the artery that is to be recorded. Pulses produced by this artery will vibrate the



(continued overleaf)

membrane. This vibration is transmitted through a suitable liquid to a pressure sensitive transistor. The transistor is specially designed so that its casing is mechanically coupled to an internal p-n junction. Vibration of the casing causes variations in the transistor current gain which correspond to arterial pulses. These signals are then transmitted to an amplifier and recorded for the physician's evaluation.

The entire transducer is enclosed in a sturdy plastic housing, the end section of which is threaded to accept a suitable holder. The end section also contains a pressure relief vent to allow the transistor to sense only pressure levels that are greater than atmospheric.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Goddard Space Flight Center
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Greenbelt, Maryland 20771
Reference: TSP73-10046

Patent status:

This invention is owned by NASA, and a patent application has been filed. Inquiries concerning non-exclusive or exclusive license for its commercial development should be addressed to:

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